62D CONGRESS, 3d Session. } HOUSE OF REPRESENTATIVES. { DOCUMENT No. 1309.

16

SAN DIEGO HARBOR, CAL.

LETTER

FROM

THE SECRETARY OF WAR,

TRANSMITTING,

WITH A LETTER FROM THE CHIEF OF ENGINEERS, REPORT OF PRELIMINARY EXAMINATION AND SURVEY OF SAN DIEGO HARBOR, CAL.

JANUARY 28, 1913.—Referred to the Committee on Rivers and Harbors and ordered to be printed, with illustration.

WAR DEPARTMENT,
Washington, January 27, 1913.

The SPEAKER OF THE HOUSE OF REPRESENTATIVES.

SIR: I have the honor to transmit herewith a letter from the Chief of Engineers, United States Army, of this date, together with copies of reports from Lieut. Col. C. H. McKinstry, Corps of Engineers, dated November 25, 1912, and January 9, 1913, with map, on preliminary examination and survey, respectively, of San Diego Harbor, Cal., including both the inner harbor and the bar entrance, made by him in compliance with the provisions of the river and harbor act approved July 25, 1912.

Very respectfully,

HENRY L. STIMSON,
Secretary of War.

WAR DEPARTMENT,
OFFICE OF THE CHIEF ENGINEERS,
Washington, January 27, 1913.

From: The Chief of Engineers, United States Army.
To: The Secretary of War.
Subject: Preliminary examination and survey of San Diego Harbor, Cal.

1. There are submitted herewith for transmission to Congress reports dated November 25, 1912, and January 9, 1913, with map, by Lieut. Col. C. H. McKinstry, Corps of Engineers, on preliminary

examination and survey, respectively, of San Diego Harbor, Cal., including both the inner harbor and the bar entrance, called for by the river and harbor act approved July 25, 1912.

2. This harbor has been improved by the United States by the construction of a dike and a jetty, and by dredging on the bar and middle ground. The existing project, adopted by the river and harbor act approved June 25, 1910, provides for dredging a channel through the outer bar 30 feet deep and 600 feet wide, and a channel through the middle ground 30 feet deep and 400 feet wide at its southerly end, widening out at the northerly end. The district officer states that the present channels are of such capacity that at low water, in ordinary weather, vessels drawing 28 feet can safely enter and depart, but in rough weather it would not be safe for a vessel drawing over 25 feet to attempt to use the bar channel at low water. While present depths are ample for most of the vessels visiting the port, the ships of the American-Hawaiian line draw as much as 27 feet, and it is stated that the new ships of this line will draw 29 or 30 feet. These ships will require for the safe navigation of the entrance at all stages and in all weathers a depth as much as 35 feet at mean lower low water.

3. The Navy has a coaling wharf at this harbor and uses the port as a base for part of its drills. In view of its interest in the harbor correspondence was had with that department respecting the present needs of the Navy, and the district officer submits estimates therefor as well as for the improvement deemed requisite in the interests of general commerce and navigation. The improvement suggested by the Navy is a depth of 40 feet in the bar channel and a depth of 35 feet through the midde ground, including the removal of a shoal opposite the coaling wharf, and the cost of this improvement is estimated at $1,063,696 and $47,533 annually for maintenance. A modification of this plan omitting some of the removal of this shoal is estimated to cost $388,637, and $22,067 annually for maintenance. The district officer states that the modified plan will afford a safe entrance to capital ships of the Navy and is inferior to the Navy plan only in affording a less convenient approach to the Navy coal wharf.

4. The improvement desired by local interests is the opening of the harbor to vessels drawing 35 feet. While vessels drawing more than 30 feet will undoubtedly be used on routes passing close to San Diego Harbor upon completion of the Panama Canal, the district officer does not believe that, for the immediate future at least, the volume of such commerce would justify the large cost of the desired improvement, or that the freight rate to San Diego by vessels of the largest size would be materially less than by vessels drawing, say, 30 feet. Recognizing, however, that some increase of facilities is required to meet the present and prospective needs of commerce, he recommends the deepening of the bar channel to 35 feet and the middle ground to 32 feet, which coincides with the improvement formerly suggested by the Navy Department, at an estimated cost of $208,786, and $19,289 annually for maintenance. He submits no recommendation regarding the work now desired by the Navy, but the division engineer states that the requirements of that department should be fully met by the adoption of the plan recommended by it.

5. These reports have been referred, as required by law, to the Board of Engineers for Rivers and Harbors, and attention is invited to the board's accompanying report of January 21, 1913, concurring with the views of the district officer.

6. After due consideration of the above-mentioned reports, I concur in general with the views of the district officer and the Board of Engineers for Rivers and Harbors, and therefore, in carrying out the instructions of Congress, I report as follows: That the improvement by the United States of San Diego Harbor, Cal., including both the inner harbor and the bar entrance is deemed advisable in the interest of general navigation so far as to secure an available harbor or channel depth of 35 feet and a channel width of 570 feet on bottom through the outer bar, and a depth of 32 feet over the area of the middle ground indicated on the accompanying map, following in general the methods described in the reports of the district officer, at an estimated cost of $208,786 for first construction and $19,289 annually for maintenance, these estimates being based on the supposition that the construction work will, as now seems desirable and advantageous, be prosecuted under a first appropriation of the full amount of the estimate.

7. It is believed that the above improvements will provide all that is at present needed by general navigation, and the correspondence with the Navy Department and the estimates based thereon are transmitted herewith for the information of Congress in case it desires to extend the improvement further in the interest of that department.

W. H. Bixby,
Chief of Engineers, U. S. Army.

REPORT OF THE BOARD OF ENGINEERS FOR RIVERS AND HARBORS ON SURVEY.

[Third indorsement.]

BOARD OF ENGINEERS FOR RIVERS AND HARBORS,
January 21, 1913.

To the CHIEF OF ENGINEERS, UNITED STATES ARMY:

1. San Diego Harbor, Cal., has been improved by the United States by the construction of a dike and jetty and by dredging on the bar and middle ground. The existing project, adopted by the act of June 25, 1910, provides for dredging a channel through the outer bar 30 feet deep and 600 feet wide, and a channel through the middle ground 30 feet deep and 400 feet wide at its southerly end, widening out at the northerly end. Expenditures on all projects to June 30, 1912, amounted to $809,819.57.

2. The act ordering the present investigation does not specify the extent of the further improvement contemplated. Local interests desire that the United States open the harbor to ships drawing 35 feet. The district officer states that the San Diego bar is generally smooth and the middle ground channel always so. The present channels are of such capacity that at low water, in ordinary weather, vessels drawing 28 feet can safely enter and depart, but in rough weather it would not be safe for a vessel drawing over 25 feet to attempt to use the bar channel at low water. Present depths are more than ample for most of the vessels that trade between San Diego and points in California, Oregon, and Washington, but the ships of the American-Hawaiian

Line, which touch at this port, draw as much as 27 feet, and it is stated that new ships of this line will draw 29 or 30 feet. These ships will require for the safe navigation of the entrance at all stages and in all weathers a depth as much as 35 feet at mean lower low water.

3. Having in mind the fact that this is the nearest Pacific home port to the Panama Canal, and that vessels drawing as much as 30 feet will engage in trade which will bring them close to this harbor and into which they would come for various purposes if sufficient depth were available, the district officer is of opinion that it is advisable for the United States to provide some increase of navigation facilities at this locality. Following the suggestion made in his report on preliminary examination, the papers in the case were referred to the Navy Department for an expression of its views as to the further improvement, if any, required in the interests of the Navy. Estimates are now submitted for the work required in the interests of commerce and that suggested by the Navy as follows:

(1) Bar channel 35 feet deep, and middle ground channel 32 feet deep, as formerly suggested by the Navy Department	$208,786
Annual maintenance of above	19,289
(2) Bar channel 40 feet deep, and middle ground channel 35 feet deep over limits now suggested by the Navy Department, as indicated on map	1,063,696
Annual maintenance of above	47,533
(3) Bar channel 40 feet deep, and middle ground channel 35 feet deep within limits indicated on map	388,637
Annual maintenance of above	22,067

4. The district officer is of opinion that the cost of further improvement in accordance with the first estimate given above, viz, $208,786, with $19,289 yearly for maintenance, is reasonable in comparison with the advantages to be obtained, and the work is reported by him as worthy of being undertaken by the United States in the interests of commerce. He makes no recommendation as to the adoption of the project desired by the Navy Department, and calls attention to the fact that the cost of the work on the middle ground may be reduced nearly $700,000 by the third plan and estimate above referred to, and states: "This plan will afford a safe entrance to capital ships of the Navy and is inferior to the Navy plan only in affording a less convenient approach to the Navy coal wharf."

5. After consideration of all data available, including that bearing upon the extensive terminal development proposed by and at the expense of the city of San Diego, the board concurs with the district officer in believing that some increase of depth at this harbor is warranted by the present and prospective demands of commerce. It believes that the plan contemplating a depth of 35 feet on the bar and 32 feet across the middle ground will reasonably well provide for these demands, and it is therefore of opinion that it is advisable for the United States to undertake this improvement, at an approximate estimated cost of $210,000, with $20,000 annually for maintenance. The full amount of the estimate should be provided in one appropriation.

6. It is recommended that the accompanying correspondence, setting forth the views of the Navy Department respecting its needs, be forwarded with this report for the information of Congress.

7. In compliance with law, the board reports that there are no questions of terminal facilities, water power, or other subjects so related to the project proposed that they may be coordinated there-

with to lessen the cost and compensate the Government for expenditures made in the interests of navigation.

For the board:

WM. T. ROSSELL,
Colonel, Corps of Engineers,
Senior Member of the Board.

PRELIMINARY EXAMINATION OF SAN DIEGO HARBOR, CAL.

UNITED STATES ENGINEER OFFICE,
Los Angeles, Cal., November 25, 1912.

From: Lieut. Col. C. H. McKinstry, Corps of Engineers.
To: The Chief of Engineers, United States Army.
(Through division engineer.)
Subject: Preliminary examination of San Diego Harbor, Cal.

1. This is a report on a preliminary examination of San Diego Harbor, Cal., including both the inner harbor and the bar entrance, called for by the river and harbor act approved July 25, 1912, and department letter of August 3, 1912.

2. The accompanying drawing [1] shows San Diego Harbor and its location with respect to other harbors, etc., in southern California. San Diego is 11 nautical miles north of the United States-Mexico boundary and 89 and 482 miles south of Los Angeles and San Francisco Harbors, respectively. The only railroad leading to it, except short local lines, is the branch of the Atchison, Topeka & Santa Fe from Los Angeles via Santa Ana. The San Diego & Arizona Railroad is under construction between San Diego and Yuma via El Centro (Imperial Valley).

3. The entrance to San Diego Harbor is fortified.

4. In the following-named documents and in the Annual Reports of the Chief of Engineers will be found information relating to physical and commercial conditions at San Diego Harbor: House Documents No. 177, Fiftieth Congress, first session; No. 961, Sixtieth Congress, first session; Senate Document No. 25, Forty-first Congress, second session.

5. The total amount spent by the United States on this harbor to date is $809,820.24. With this amount a dike has been built to divert the San Diego River from San Diego Bay into False Bay; 18.85 acres of land has been purchased on North Coronado Beach Island; a jetty 7,500 feet long has been built to the height of extreme high water; and 475,228 and 688,873 cubic yards have been dredged from the middle ground and outer bar channels, respectively. On completion of the last dredging contract, May 3, 1912, the channel through the outer bar was 30 feet deep over a width of 600 feet and 32 feet deep over a width of 300 feet at mean lower low water. The channel through the middle ground was 30 feet deep, its width increasing from 700 feet at the southerly end to 1,000 feet at the northerly end. The average height of the high waters above the plane of reference is 4.8 feet. The average of the higher high tides is 5.5 feet. For present channels see map herewith.

6. The act directing the preliminary examination does not specify the extent of the further improvement contemplated. The desires of interested parties as developed by conferences and by a public

[1] Not printed.

hearing held at San Diego October 16, 1912, are set forth in the accompanying[1] papers, viz: "Report on San Diego Harbor respectfully submitted by the leading business and civic organizations of San Diego, Cal." dated October 16, 1912; letter dated October 16, 1912, from Wide-Awake Improvement Club of San Diego, Cal.; letter dated October 16, 1912, from Capt. A. J. Foster, harbor master, San Diego, Cal. Attention is invited particularly to the first mentioned of these inclosures.

7. Omitting minor work in the inner harbor, the request of the community is that the United States open the harbor to ships drawing 35 feet by providing a channel across the outer bar about 1,000 feet wide and 40 feet deep and one across the "middle ground" of corresponding depth (say, 37 feet) and wide enough for convenient use by naval vessels approaching and leaving the Navy coal dock.

8. The commercial statistics of the port for the calendar year 1911 are given at the end of the inclosure[1] entitled, "Report on San Diego Harbor respectfully submitted by the leading business and civic organizations of San Diego, Cal." The diagram with the annual report of the Chief of Engineers for 1912 shows that there has been a considerable increase in freight tonnage and especially in freight value during the last few years.

9. At present the exports from San Diego are mostly the productions of the fields, vineyards, and orchards of a small area of country in close proximity to the city. The more important imports are building materials, fuel (coal, coke, oil), and general merchandise (miscellaneous articles of every description required by a prosperous, rapidly growing, nonmanufacturing community). These articles are distributed to a larger area than that from which the exports are collected. A considerable quantity of general merchandise brought in by large vessels is either transferred to rail for Los Angeles and neighboring cities or to smaller vessels for coast points (Ventura and Santa Barbara).

10. The Panama Canal and the building of the new railroad from San Diego to Yuma are the foundation on which this community bases its expectation of a large increase in the business of the port. It is preparing for this business by constructing a municipal terminal at a cost of $1,000,000. The canal will shorten water routes to this port, as to all other ports on this coast. The completion of the railroad will make San Diego the terminus of a transcontinental line and will add to it as a "back country" the Imperial Valley and part of Arizona and New Mexico.

Table of distances.

From—	To—	Via—	Distance in miles.
Phoenix (Salt River project)	Los Angeles Harbor	Atchison, Topeka & Santa Fe Ry.	511
Phoenix	do	Southern Pacific	471
Do	San Diego Harbor	Southern Pacific and San Diego & Arizona (building).	[2] 395
Yuma	Los Angeles Harbor	Southern Pacific	271
Do	San Diego Harbor	San Diego & Arizona (building).	[2] 195
El Centro	Los Angeles Harbor	Southern Pacific	237
Do	San Diego Harbor	San Diego & Arizona (building).	[2] 122

[1] Not printed.

[2] About.

It is fair to presume that the building of the new railroad will add greatly to the commerce of the port.

11. The $1,000,000 above referred to is being expended by the city in the construction of a pier 800 feet long and 130 feet wide at the foot of D Street, and a bulkhead about 2,500 feet long extending northerly from the pier. On either side of the pier a depth of 35 feet and from the pier to deep water in the bay a depth of 30 feet is to be provided. The space in rear of the bulkhead, amounting to about 60 acres, is to be filled to street level and along the front of the bulkhead dredging is to be done to the depth of 20 feet. Unloading devices on the pier and warehouses, etc., on the fill are also to be provided. This terminal should reduce the time and cost of discharging and taking on freight, and do much to draw commerce to the port.

12. Besides the municipal terminal and certain private lumber and oil wharves the more important existing wharves are the coal wharf at the foot of G Street, the two "Santa Fe" wharves, and the Pacific Coast Steamship Co.'s wharf. There is 25 feet alongside the coal wharf; 25 and 30 feet alongside the Santa Fe wharves, respectively, and 24 feet alongside the Pacific Coast Steamship Co.'s wharf. The tracks of the Atchison, Topeka & Santa Fe Railway run out on the coal wharf and the southerly Santa Fe wharf. These terminals are hardly adequate to the demands upon them.

13. The San Diego bar is generally smooth; the middle ground channel always so. The present channels are of such capacity that at low water, in ordinary weather, vessels drawing 28 feet can safely enter and depart. In rough weather, however, it would not be safe for a vessel drawing over 25 feet to attempt to use the bar channel at low water. Present depths are more than ample for most of the vessels that trade between San Diego and points in California, Oregon, and Washington, but the ships of the American-Hawaiian Line, which ply between Salina Cruz and Honolulu, touching at San Diego, San Francisco, and Seattle, and which have been running to San Diego for 10 years, draw at present as much as 27 feet, and the new ships of that line will draw 29 or 30 feet, as I have been informed by the general manager of the company. These ships will require for the safe navigation of the entrance at all stages and in all weathers a depth as much as 35 feet at mean lower low water.

14. Upon the opening of the Panama Canal it will undoubtedly be the case that vessels drawing more than 30 feet will engage in trade between the Pacific ports of North America and Asia and the Atlantic ports of North, Central, and South America, and Europe. These vessels will pass close to San Diego Harbor, and would probably stop there to deliver and receive freight and for other purposes if the increased depth asked for be provided. But it is not thought that for the immediate future at least the volume of such commerce would justify the cost of so great an improvement or that the freight rate to San Diego by vessels of the largest size would be materially less than that by vessels drawing, say, 30 feet.

15. In spite of the arguments contained in the inclosures, there would therefore appear to be no immediate prospective need, at least no adequate need, for entrance channels capacious enough for vessels drawing 35 feet. (See par. 7 above.) I am of opinion, however, that it would be advisable for the United States to provide channels required by vessels drawing 30 feet, if the cost of the work

is not out of proportion to the benefits that may be expected to follow. The bar channel should be about 600 feet wide and 35 feet deep. The middle-ground channel should be 32 feet deep. The original deepening should be to somewhat greater depths than stated, to allow for deterioration. As regards the proper width of channel across the middle ground, attention is invited to correspondence with the Navy Department, attached to the report on the preliminary examination directed by the river and harbor act of March 2, 1907, and published in House Document No. 961, Sixtieth Congress, first session. The funds available under the last project did not permit dredging to be done as far east as the line indicated by the Navy Department (see map herewith), but any increased depth provided over the middle ground should extend to the line referred to.

16. It is suggested that the matter of obtaining an increased depth in the entrance to this harbor be again referred to the Navy Department, either now or upon the submission of the report of the survey, if one is ordered, in order that the needs of the Navy at this place may receive full consideration. The early completion of the Panama Canal, the fact that this is the nearest home port thereto on the Pacific coast, and that it is a fortified port, may possibly make advisable for naval purposes a greater increase in the depth of the entrance than is above referred to.

17. I recommend that I be authorized to make the survey required to obtain the data necessary for the preparation of a project for obtaining the channels referred to in paragraph 15 and an estimate of the cost thereof.

18. There is no question in this case of the development or utilization of water power for industrial or commercial purposes, or of any other subject than those discussed above.

C. H. McKinstry.

[First indorsement.]

United States Engineer Office, Pacific Division,
San Francisco, Cal., November 29, 1912.

To the Chief of Engineers, United States Army:

Concurring in the views expressed by the district officer.

Thos. H. Rees,
Lieut. Col., Corps of Engineers,
Division Engineer.

[Third indorsement.]

Board of Engineers for Rivers and Harbors,
December 10, 1912.

To the Chief of Engineers, United States Army:

For reasons stated herein, the board concurs with the district officer and the division engineer in recommending a survey in order to determine the extent and advisability of the improvement. It is recommended that the views of the Navy Department be obtained before the survey is made and that the district officer submit estimates for the improvement desired by that department, as well as for the improvement that he believes necessary for commercial purposes.

For the board:

Wm. T. Rossell,
Colonel, Corps of Engineers,
Senior Member of the Board.

REPORT OF SURVEY OF SAN DIEGO HARBOR, CAL.

UNITED STATES ENGINEER OFFICE,
Los Angeles, Cal., January 9, 1913.

From: Lieut. Col. C. H. McKinstry, Corps of Engineers.
To: The Chief of Engineers, United States Army
(Through Division Engineer).
Subject: Report of survey, San Diego Harbor, Cal.

1. This is the report, with estimates of cost, called for by department letter of December 20, 1912, on (*a*) deepening the middle ground to 32 feet and the outer bar channel to 35 feet, and (*b*) deepening the middle ground to 35 feet and the outer bar channel to 40 feet, San Diego Harbor.

2. No field work was required for making estimates of the quantities to be removed either on the middle ground or on the bar, existing maps being sufficient for the purpose.

It was considered advisable, however, to make a certain number of probings to determine whether a channel 40 feet deep could be obtained without encountering material that could not be economically removed with a self-propelling suction dredge. These probings were made between January 4 and 7, 1912, and nothing but sand was met with.

MIDDLE GROUND.

3. The areas over which an increased depth is figured on for the middle ground are indicated on the accompanying tracing. Plan A contemplates a depth of 32 feet over the area recommended in the report on the preliminary examination dated November 25, 1912; plan B is the plan recommended by the Navy Department December 19, 1912, and contemplates a depth of 35 feet; plan C contemplates 35 feet over the area of plan A. To allow for changes that may take place between now and the time when the new work is begun, the depths used in the estimates are 34 feet in plan A and 37 feet in plans B and C, and 20 per cent is added in each case to allow for material that may be stirred up and redeposited within the limits of the area dredged during the time the work is going on. The quantities to be removed are given in Table I below.

4. It is not seen how any assistance can be given this work by the construction of jetties or training walls; it is a case for dredging alone. In all dredging work previously done on the middle ground suction dredges have been used and the material has been deposited at sea. In the new work considered the material might be pumped ashore on Coronado Beach Island, assuming that the owners would permit the same, or encourage it by the construction of dikes or bulkheads, and in this case a lower price might be obtained than those assumed in the following paragraph:

5. The price paid for dredging on the middle ground has ranged from 14.89 cents to 65 cents per cubic yard. Under the contract recently completed, which included dredging on outer bar as well as on middle ground, the price was 14.89 cents per cubic yard. The dredge used was a self-propelling hopper suction dredge. It will not be safe to assune that so low a price can be obtained again. Twenty-five cents will be assumed for Plan A and 20 cents for the larger quantities involved in Plans B and C. Adding 10 per cent

for engineering and contingencies, the cost will then be as in Table I below.

6. These increased depths will, of course, not maintain themselves. Past experience at this place indicates, however, that deterioration will not be rapid. It will probably be three or four years before any maintenance work will be needed, and it may be assumed that thereafter the maintenance of the project depths may be effected by the removal at intervals of a few years of a quantity of material that will average yearly the quantity represented by a depth of one-half foot over the entire area. The cost of this dredging, taken at 25 cents per cubic yard, is given in Table I.

TABLE I.—*Middle ground.*

(A) (Limits as suggested by Navy Department in 1908; depth, 32 feet.) 363,222 cubic yards, at 25 cents, $99,886. Maintenance, $6,789 a year.

(B) (Limits as suggested by Navy Department, 1912; depth, 35 feet.) 3,744,320 cubic yards, at 20 cents, $823,750. Maintenance, $32,255 a year.

(C) (Limits, same as in Plan A; depth, 35 feet.) 675,872 cubic yards, at 20 cents, $148,691. Maintenance, $6,789 a year.

OUTER BAR.

7. The deepening of a bar channel may be accomplished by dredging alone or by dredging in connection with a jetty or jetties. No ocean bar more favorable than this one for the use of dredging alone is known. Storms are rare, and the experience already had indicates that dredged channels deteriorate but slowly. The present channel is 30 feet deep and 600 feet wide. It will be assumed that the increased depths are to be obtained within the width of the present channel. The channel 37 feet deep would then be 570 feet wide at the bottom (Plan A′) and the channel 42 feet deep, 540 feet wide at the bottom (Plan B′). Adding in each case 20 per cent for accretions during the progress of the work, the quantities to be removed under the two plans will be as given in Table II below. All dredging previously done on this bar has been done with self-propelling suction dredges, and the price has ranged from 14.89 cents to 60 cents per cubic yard. Under the last contract the price was 14.89 cents per cubic yard. It will not be safe to assume that so low a price will be obtainable again; 25 cents will be assumed for Plan A′ and 20 cents for the larger quantity to be removed under Plan B′. The first cost of the work, 10 per cent being added to cover engineering and contingencies, will then be as in Table II.

8. The forces which formed the present bar and which seem to be in equilibrium when the bar carries about 21 feet of water, will continue to strive for that depth, and maintenance dredging will be required from time to time to restore any deeper artificial channel. It is not possible to calculate accurately the amount of maintenance dredging that will be necessary. Guided, however, by the behavior of bar channels previously dredged at this place, it will be assumed that the deepened channels will require for their maintenance the periodical removal of a quantity of material that will average yearly the quantity represented by a depth of one-half foot over the entire area of the channel. The maintenance dredging being small in quantity will be assumed to cost 25 cents per cubic yard.

TABLE II.—*Outer bar.*

Plan A′.—Channel 35 feet deep and 570 feet wide at bottom; 396,000 cubic yards; cost, $108,900; maintenance, $12,500 a year.

Plan B′.—Channel 40 feet deep and 540 feet wide at bottom; 1,090,666 cubic yards; cost, $239,946; maintenance, $15,278 a year.

9. The total cost of the various plans will be:

Bar channel, 35 feet deep, and middle ground channel, as in Plan A, 32 feet deep, $208,786, with $19,289 yearly for maintenance.

Bar channel, 40 feet deep, and middle ground channel, as in Plan B, $1,063,696, with $47,533 yearly for maintenance.

Bar channel, 40 feet deep, and middle ground channel, as in Plan C, $388,637, with $22,067 yearly for maintenance.

10. Past experience at this place indicates that dredging may be counted on to obtain and maintain either the 35 or the 40 foot channel. Jetty work should not be considered until the dredging method has been tried and found unsuccessful. The building of jetties across the bar would probably not cause a channel 40 feet, or even 35 feet deep, to scour; dredging would have to be resorted to in addition. But should twin jetties be built and either channel dredged, deterioration would be slower than in the case of a dredged channel unprotected by jetties. It is doubtful, however, whether an east jetty alone would have any such effect, and an extension of the east jetty might cause a recession of the Coronado shore. A west jetty would protect the dredged cut from material that would otherwise be washed into it in westerly and southwesterly storms. Should jetties be built at this place, the west one should be built first and the present east jetty should not be extended until the need of extending it had manifested itself.

11. The report on the survey called for by the river and harbor act of March 2, 1907, is printed in House Document No. 961, Sixtieth Congress, first session, and contains a discussion of the cost of obtaining a 30-foot channel by dredging alone and by jetties supplemented by dredging. This discussion shows that the advantage is with the method by dredging alone. A similar discussion applied to 35 and 40 foot channels would show that the advantage of the dredging method increases with the depth desired. Under the jetty plus dredging method there would doubtless be less maintenance dredging, but the saving thus made would be much more than offset by the interest on the cost of the jetties. This excess of interest over the cost of maintenance dredging would be much greater for the 40-foot channel than for the 35-foot channel.

12. The recommendation made in the report on preliminary examination was that channels capacious enough for vessels drawing 30 feet were commercially advisable, provided the cost of obtaining such channels was not excessive. The reasons there given were, briefly, a probable increase in the volume of commerce and in the size of ships, the building of a municipal terminal at a cost of $1,000,000, and naval convenience. It is believed that the cost estimated above, viz, $208,786, with $19,289 yearly for maintenance, is reasonable in comparison with the advantages to be obtained, and the work is therefore reported as worthy of being undertaken by the United States.

Diego, and the harbor is used as a base for a part of the drills of the Pacific Torpedo Flotilla; the capital ships of the Pacific Fleet are at this date engaged in target practice in the immediate vicinity. The General Board believes it probable that the naval use of this port will increase in the future rather than the reverse. There is room in the inner harbor for at least 16 capital ships in quiet, perfectly protected water, and there is now a limited coast defense.

3. For all the reasons outlined above it is desirable that a depth of 35 feet over the middle ground and 40 feet over the bar be provided to permit the entrance at all times to the inner harbor of capital ships of the Navy, which will probably draw as much as 32 feet in the next designs. The channel opposite the naval coaling wharf should be widened and straightened to permit an easy turn of vessels of great length and draft. The General Board therefore recommends the survey mentioned in paragraph 2 of the letter of the Chief of Engineers. The limits of the desired channel are shown on the accompanying blue print.

4. In its letter, No. 404, of March 18, 1909, the General Board adheres to its "opinion, heretofore expressed, that it is not good policy, economical, or desirable, from a naval standpoint, to establish a naval station on the coast of California south of San Francisco." The expressions above regarding the desirability of having the inner harbor of San Diego available for capital ships of the Navy are not to be taken as a reversal of opinion in this respect.

GEORGE DEWEY.

NAVY DEPARTMENT,
December 19, 1912.

Approved.

BEEKMAN WINTHROP,
Acting Secretary of the Navy.

LETTER OF ACTING SECRETARY OF THE NAVY TO SECRETARY OF WAR.

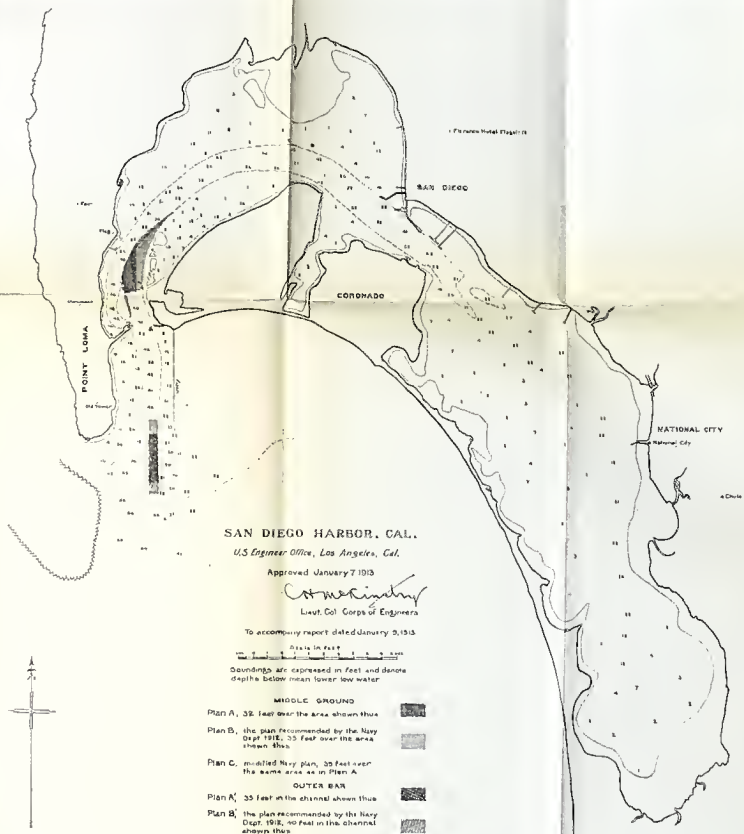
NAVY DEPARTMENT,
Washington, December 19, 1912.

From: Acting Secretary of the Navy.
To: The honorable the Secretary of War.
Subject: Improvement of San Diego Harbor.

1. Referring to a letter from the Chief of Engineers, United States Army, of recent date, forwarded by you, relative to the improvement of San Diego Harbor, there is forwarded herewith the original papers in this matter with the recommendation of the General Board, which has been approved by this Department.

2. It is requested that these papers be returned when they shall have served their purpose.

BEEKMAN WINTHROP.



SAN DIEGO HARBOR, CAL.

U.S. Engineer Office, Los Angeles, Cal.

Approved January 7 1913

Lieut. Col Corps of Engineers

To accompany report dated January 9, 1913.

Scale in Feet

Soundings are expressed in feet and denote depths below mean lower low water

MIDDLE GROUND

Plan A, 32 feet over the area shown thus

Plan B, the plan recommended by the Navy Dept 1912, 35 feet over the area shown thus

Plan C, modified Navy plan, 35 feet over the same area as in Plan A

OUTER BAR

Plan A' 35 feet in the channel shown thus

Plan B' the plan recommended by the Navy Dept. 1912, 40 feet in the channel shown thus

SAN DIEGO HARBOR CAL.
Noteon Dec. 16, 1909 | 82d Congr. 2d Sess.